

Laboratory studies have indicated that nerve axonal regeneration across a vascularized nerve graft—a nerve graft that is harvested with its accompanying artery and vein, which can then be sutured by microvascular anastomotic techniques to a recipient artery and vein, providing an ongoing blood supply to the nerve graft segment—may be better than that across standard nerve grafts.

Human anatomic studies have identified several expendable nerves that accompany expendable arteries and veins of a size suitable for microvascular anastomosis. These include the sural nerve, antebrachial cutaneous nerve, radial sensory nerve, and the distal peroneal nerve. In selected clinical situations, for example, patients with long defects or defects that cross extremely scarred or hypovascular areas, the chances of ultimate functional recovery may be improved.

Recent intensive research into sutureless repair methods has led to the concept of using artificial nerve conduits in place of nerve autografts to overcome deficits of a modest length. Laboratory studies using both rats and nonhuman primates showed that regeneration through a biodegradable nerve conduit was equal to that across standard nerve grafts. The advantage of such a technique, obviating the need to harvest an autograft from a donor site with the potential creation of a painful neuroma, is obvious.

Finally, as experience with tissue expanders grows, surgeons are finding that peripheral nerves can be gradually lengthened by tissue expansion techniques. Laboratory studies indicate that the lengthened segment maintains anatomic and physiologic continuity. By lengthening the distal (denervated) segment, significant nerve gaps might be overcome.

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Gynecomastia

GYNECOMASTIA (Greek *gynec*, denoting “relationship to women,” and *mastos*, “breast”) refers to the presence of femalelike mammary glands in a man or a boy. An incidence as high as 65% in adolescents and 40% in adults has been reported. Most patients are not treated. Adolescents are usually told they will outgrow the problem, and most adults either are told to lose weight or are not sufficiently bothered by its presence to seek treatment.

Considering the high incidence of gynecomastia and the fact that medical treatment is rarely indicated and more likely is contraindicated, surgical treatment should be considered in properly selected patients. Surgical correction is particularly important to counter the self-consciousness and embarrassment that invariably accompany this disorder in adolescence.

Numerous conditions may be associated with gynecomastia. They may be categorized as physiologic (neonatal,

pubertal, or involutional), endogenous (testicular, adrenal, thyroid, pituitary, or other), or exogenous (hormones or drugs). In most patients a cause cannot be identified. If it develops slowly and is asymptomatic, the cause may be ignored in an otherwise healthy person. If the gynecomastia began before puberty, the cause should be investigated. When it begins during puberty, the cause is usually idiopathic. Because 62% of cases of gynecomastia may be drug related, a drug history may be helpful. It should be noted that the extent of gynecomastia of any cause may be greatly asymmetric or even unilateral.

Although carcinoma of the male breast is rare, accounting for 0.2% of all cases of carcinoma in men, should a unilateral, firm, irregular mass be detected on examination, a biopsy should be done. Otherwise, biopsy is unnecessary.

The surgical technique must be adapted to the size and type of gynecomastia and the amount of redundant skin. Whenever possible, the incisions should be done at the border or within the areola without displacing the nipple. Historically, surgical treatment consisted of sharp dissection of the fat and parenchymal tissue that make up the deformity. Undesired sequelae and complications included unattractive scars, contour deformities, and hematoma. Since 1980 many plastic surgeons have been using suction lipectomy as well as sharp dissection in the treatment of gynecomastia. With the addition of suction lipectomy, the incidence of contour deformities and hematomas has decreased. Some patients can be treated with suction lipectomy alone, but most require a combination approach. Suction lipectomy is done first, followed by sharp dissection of any residual parenchyma that requires removal. In general, excellent cosmetic results can be expected from experienced plastic surgeons.

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Head and Neck Reconstruction

TUMOR ABLATION in the head and neck area has a major functional and aesthetic impact, causing profound changes in the subsequent quality of life. This is especially the case if reconstruction is delayed for fear of masking recurrent disease. This concept is now untenable as computed tomographic (CT) scans and CT-directed needle aspiration biopsies are reliable in detecting disease, even in deep tissues. Further, immediate reconstruction offers the best chance for early rehabilitation. The goals of such reconstruction are to restore speech and swallowing, prevent aspiration and drooling, and produce a primarily healed wound with the least possible deformity.

Two advances in the past ten years have dramatically altered our approach to this problem. McCraw's description of independent myocutaneous vascular territories in 1977 led to the definition of several useful myocutaneous flaps for a head and neck operation. The pectoralis major myocutaneous flap

is the most versatile one, offering a large skin paddle for oropharyngeal or cutaneous replacement and a bulky muscle that can securely cover irradiated carotid vessels. The trapezius and latissimus dorsi myocutaneous flaps have also been used for similar purposes. These single-stage reliable flaps have now replaced temporal, deltopectoral, and multistage tube pedicle flaps.

The second major advance has been in describing fasciocutaneous and compound flaps suitable for microvascular transfer to the head and neck. The radial forearm and parascapular fasciocutaneous flaps have the advantage of thinness and conform well to a three-dimensional defect in the oral cavity and oropharynx. The tethering effect of a bulky myocutaneous flap on the tongue is avoided, thereby enabling better speech and swallowing. The iliac osteocutaneous free flap can be used for immediate, one-stage total mandibular reconstruction, even in previously irradiated fields, eliminating the "Andy Gump" deformity. Replacing the pharyngoesophagus with a revascularized segment of jejunum allows for early swallowing and adequate oral intake as early as one week after the operation. Microvascular reconstruction offers the distinct advantages of functional tissue transfer and a superior aesthetic result. The risk of complete failure due to vascular thrombosis is ever present, however. Microvascular expertise and considerable experience are critical factors for a successful outcome.

It is clear that one-stage immediate reconstruction for head and neck cancer improves the quality of life and shortens the hospital stay. This is especially important when a cure is uncertain and life expectancy is limited.

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Flap Surgery in the 1980s

IN RECENT YEARS there has been a concentrated national and international effort directed at reexamining the blood supply to the skin. As a direct result of this intensive effort, the number and versatility of available flaps have grown dramatically over the past few years. This has resulted in an ability to treat the most complex injuries and defects. The blood supply to skin, and therefore flaps, has been divided into four basic groups. First, "random flaps" have a blood supply that is entirely dependent on a subdermal vascular network, or plexus. Beneath this plexus, running on the surface of the deep fascia over the muscle, is another vascular network that communicates with the subdermal plexus through a series of vertical vessels in the subcutaneous tissue.

The elevation of a flap incorporating the deep fascia, the subcutaneous fat, and vessels including the skin is the second group, referred to as a "fasciocutaneous flap," and elevation of the flap, including all of the above with the underlying muscle, is the third, known as a "myocutaneous flap." Perforating vessels running directly from the muscle to the skin

through the two previously mentioned plexuses are responsible for this relative revolution that has occurred in reconstructive plastic surgery. As experience has shown, not only do we have "spare" or expendable muscles available, but the large size of muscles such as the latissimus dorsi muscle or the skin territory supplied by the rectus abdominis muscle, among others, has allowed for the reconstruction or coverage of large defects of complex structures such as the breast after a mastectomy.

Recently it has become evident that the vascular plexus over the fascia may be fed not only from perforators arising from the underlying muscle but also by direct communication from deeper, well-known vessels such as the radial artery or the peroneal artery in the leg, which is the fourth type of blood supply.

The selection of a flap based on these larger vascular pedicles has dramatically improved the versatility and safety of these flaps in reconstructing areas as diverse as the hand and the head and neck. The added ability to include viable bone or even nerves has dramatically increased the range of reconstruction options available. Our improved understanding of the blood supply to skin and underlying structures has now made it possible to reconstruct defects safely in one stage with far less disfigurement to patients and with functional results that, even if possible, were far more complex to achieve just a few years ago.

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Tissue Expansion

TISSUE EXPANSION was introduced to the plastic and reconstructive surgery community in 1976 as an alternative method for providing ideal and additional local tissue cover. Improved techniques have resulted in shorter hospital stays, decreased morbidity and complication rates, and stable aesthetic and functional reconstructions. In addition, advances in implant design and concepts now permit clinicians to vary their reconstructive procedures by using the expansion technique.

Long-term expansion is a procedure whose end result is similar to the effects on the anterior abdominal wall produced by the enlarging uterus in a pregnant woman. Long-term expansion consists of two stages: first, the expander(s) is inserted; and, second, expanded tissues advance after a period of serial expansions for as long as two to four months. The newly recruited skin may provide near-perfect color, texture, and sensory qualities to match the lost skin. The hallmark of the procedure remains a minimal donor-site scar. At this time, the source(s) for the additional tissue remains